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27 June 1955

MEMORANDUM FOR: Assistant Director for National Estimates

SUBJECT : NIE 11-5-55.

REFERENCE : Memorandum on Same Subject, Dated 10 June 1955.

1. The contribution to the subject NIE submitted on 10 June 1955 by the EIC Ad Hoc Working Group on NIE 11-5-55 was considered to be a first approximation because it was based in part on information which was considered outdated and unrealistic.

2. The changes to the 17 June 1955 draft of NIE 11-5-55 which are attached reflect recalculations based on up-to-date information by including data on the recently observed Soviet fighter aircraft now shown in APPENDIX B, page 93. A more realistic assumption was made as to how the Soviets will develop the improved performance characteristics estimated in APPENDIX C, page 97. Rather than assume that the USSR would produce an entirely new aircraft model in 1957, it was assumed that these new characteristics could be obtained by improving the FARMER and the FLASHLIGHT models.

3. On the basis of these changes, it is believed that the two principal objections with respect to aircraft stated in the reference memorandum and the foreword of the contribution have been overcome.

4. Although the other representatives on the EIC Ad Hoc Working Group have been notified of the attached changes and tentatively have agreed to them, these revisions have not yet been coordinated fully in the EIC.

STAT

Chairman
EIC Ad Hoc Working Group
on NIE 11-5-55

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Suggested Changes to 17 June Draft of NIE 11-5-55.

Page	Paragraph	Line	Change
7	12	9 & 10	Drop, "large quantities rather than upon special purpose capabilities."
			Substitute, "few models in large quantities."
83	123	3	Drop, "can be measured only"
			Substitute, "has been measured primarily"
83	123	8	Drop, "involve certain imprecisions"
			Substitute, "are only approximations"
83	123		Drop last sentence entirely.
83	124	2	Drop, "40 billion"
			Substitute, "38 billion"
83	124	3	Drop, "96 billion"
			Substitute, "86 billion"
83	124	3	Insert the following new sentence and figure after the end of the first sentence of this paragraph: "Figure 1 shows how the total cost of the Sino-Soviet air defense program is allocated through time and by principal air defense function."

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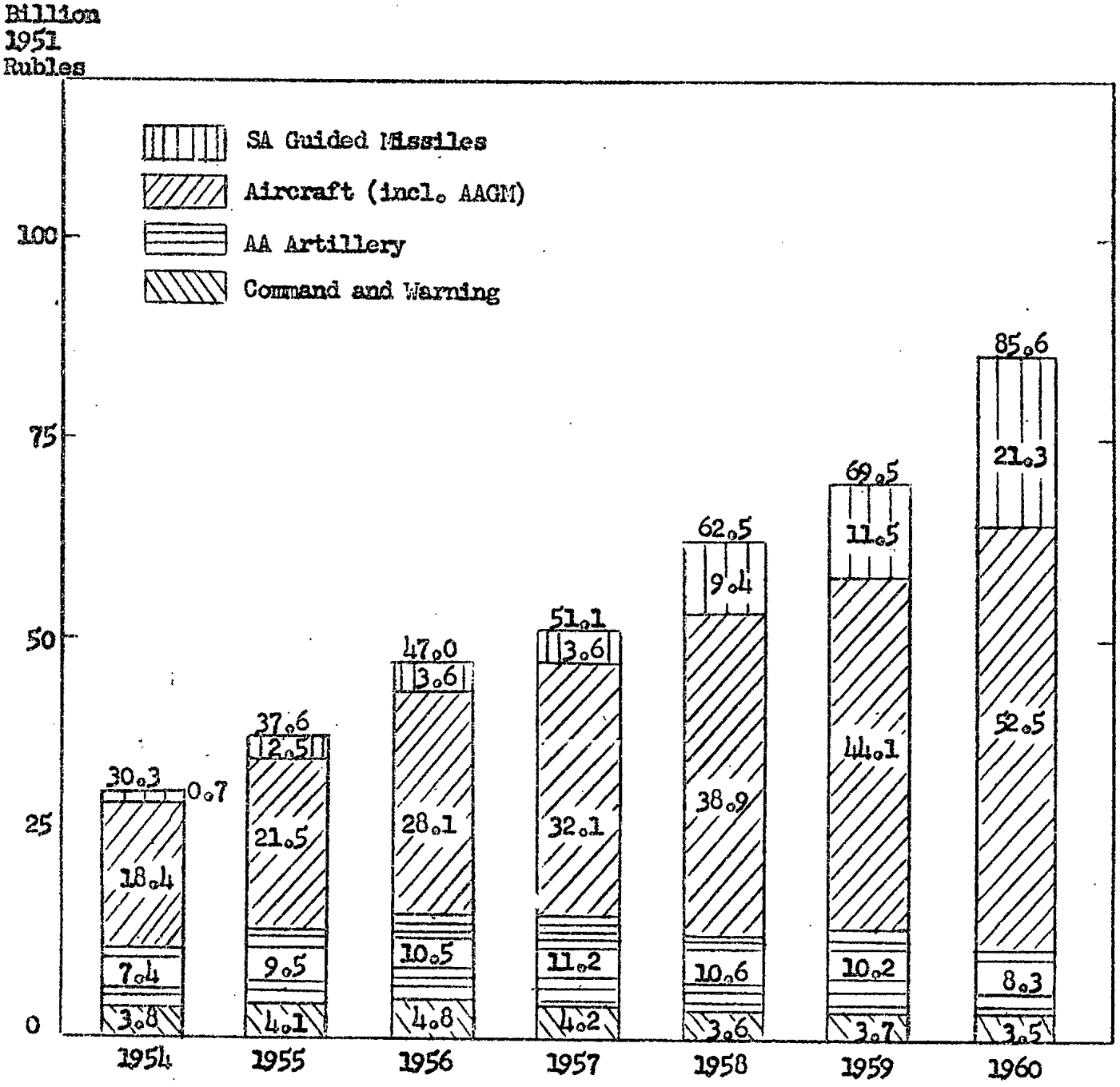
Figure 1

Estimated Sino-Soviet Bloc Air Defense Program
Initial and Operating Cost, 1954 to 1960



Page	Paragraph	Line	Change
83	124	4	Drop, "24 billion"
			Substitute, "22 billion"
			Drop, "60 billion"
			Substitute "53 billion"
84	125	2	Drop, "29 percent"
			Substitute "28 percent"
84	125	3	Drop, "60 to 65 percent"
			Substitute "56 to 58 percent"
84	125	Table	Drop and substitute table as follows:

Billion 1951 Rubles

Year	Estimated Military Expenditures			Projected Air Defense Program	Balance for Other Programs
	USSR	Eusats	Bloc		
1954	127	26	153	30	123
1955	137	26	163	38	125
1956	139	26	165	47	118
1957	141	26	167	51	116
1958	145	26	171	62	109
1959	147	27	174	70	104
1960	147-154	27	174-181	86	88-95

85	126	Table	Drop and substitute table as follows:

Billion 1951 Rubles

Year	Projected Air Defense Program	Other Programs	Total Expenditures
1954	30	123	153
1955	38	123	161
1956	47	123	170
1957	51	123	174
1958	62	123	185
1959	70	123	193
1960	86	123	209

Page	Paragraph	Line	Change
85	127	1-5	Drop first two sentences. Substitute: 127. "Thus, this air defense program will constitute a substantial but not impossible burden upon the Bloc economy."
85	127	5 & 6	Drop, "On the other hand,"
85	127	8	Drop, "56 billion" Substitute, "48 billion"
86	127	5	Add to end of line, "industrial sector of the"
86	128	5-6	Drop, "accounting for 10 percent of the cost of the program in 1954 and 34 percent in 1960."
86	128	6-8	Drop third sentence. Substitute, "The electronic requirements for this air defense program together with other military and essential civilian demands exceeds the currently estimated Soviet Bloc production of electronics for 1958 to 1960."

Page	Paragraph	Line	Change
87	128	5	Drop, "12½ percent" Substitute, "average 13½ percent"
98	Appendix D		Drop present Appendix D. Substitute the following Appendix D to explain the method used in calculating the economic sections.

APPENDIX D

1. The calculation of costs of the air defense program is total in its approach, including all items which can be directly charged to the Bloc air defense program over the period of this estimate. In estimating the cost of this complex air defense program, it was necessary to distinguish between initial costs and operating costs. Initial costs are those that occur only once during the establishment of a program and include such items as base facilities, major equipment, spares for stocks and pipeline, initial training, and transportation. Operating costs are those expenditures which recur regularly, representing the consumption of fuel and maintenance spares, the provision and support of personnel, and the replacement of equipment. However, three types of initial and operating costs were specifically omitted from the calculation. The first type includes costs incurred before 1955, such as drone aircraft and some radar. The second type includes costs incurred in providing facilities and services used for other purposes as well as air defense, such as common-use air bases and the superior command structure. Finally, certain costs such as those for warheads were not included because they were not available.

2. The air defense programming is based on the set of military requirements established in this estimate. In order to reflect changes in weapon systems and the composition and numbers of operating units, cost data were organized and summarized at the smallest

practical operational military unit. For scheduling, we have taken the number of units (i.e. missiles, AAA, and aircraft) estimated to be deployed at mid-year as the average number of units operating in the air defense system for that year. It is assumed that the initial costs were incurred the year previous to the first full operating year. Initial costs of the units for each category of major equipment and equipment spares were estimated, giving consideration to the lower costs associated with the volume of production implied in this estimate. It was assumed that trained operating units were the goal of the program. As soon, therefore, as sufficient major equipment became available from production, an operating unit was scheduled for activation and provided with a complete set of special and organizational equipment, initial stocks, and personnel.

3. This activation schedule became the basis of phasing the initial system costs into a time pattern. The cumulative total of the various types of units activated formed the basis for working up the operating costs. The operating costs, reflecting the consumption of fuels and spare parts, the maintenance of the establishment and the replacement of major equipment were then applied. During the period of the estimate some primary operating units will be deactivated. In such cases the air defense system is credited for those items that could properly be carried over to a new unit provided with higher performance major equipment.

4. The estimated initial costs of the program from 1954 to 1960 are detailed in Table 1 by sub-categories of programs and, similar detail is presented for estimated operating costs in Table 2. It should be noted that the initial costs exceed total operating costs. Because the guided missile program must start from a zero base there is a very large ratio of initial to operating costs in the early years. The ratio of other programs will vary from year to year according to the quantity of initial equipment introduced to the air defense program.

5. In Table 3 the air defense program is recast in terms of the economic sectors upon which the program must impinge for the satisfaction of its requirements. From the standpoint of investment goods the important item in the table is the amount of total industrial procurement which amounts to 21 billion rubles in 1955 and 69 billion rubles in 1960. Put another way, 21 of the currently estimated 78 billion rubles of military industrial goods procurement in 1955 is for the air defense program. Assuming that the current level of hard goods procurement for military programs other than air defense will not decline in the aggregate over the period of this estimate, military hard goods procurement would have to increase 62 percent from 1955 to 1960 to implement the required air defense program.

6. An important aspect of the air defense program cost which

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Table 1

Estimated Sino-Soviet Bloc Air Defense Program
Initial Cost, 1954 to 1960

Billion 1951 Rubles

	1954	1955	1956	1957	1958	1959	1960
Aircraft Program	6.25	6.64	10.67	11.06	14.57	15.73	18.71
Aircraft Armament Program	0.07	0.12	0.21	1.62	2.90	4.40	5.56
Spare Engine Program	1.75	1.91	3.31	4.00	4.57	4.39	5.10
Airfield Augmentation	3.00	4.58	4.58	3.81	3.05	3.05	2.29
Command and Control Program	0.21	0.05	0.03	0.02	0.00	0.00	0.00
Communication System	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Radar Program	1.80	2.00	2.49	1.47	0.74	0.74	0.49
Heavy Gun Program	1.29	2.40	2.40	2.43	1.35	1.35	0.00
Fire Control (Heavy Gun)	0.32	0.41	0.46	0.36	0.36	0.18	0.18
Light Gun Program	0.99	1.15	1.21	1.25	1.19	0.64	0.00
Fire Control (Light Gun)	0.00	0.36	0.72	1.08	1.44	1.53	1.44
SA Guided Missile Program	0.73	2.36	2.90	2.32	7.47	8.52	17.30
Total	16.81	22.38	29.38	29.82	38.04	40.93	51.47

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Table 2

Estimated Sino-Soviet Bloc Air Defense Program
Operating Cost, 1954 to 1960

Billion 1951 Rubles

	1954	1955	1956	1957	1958	1959	1960
Aircraft Program	7.13	7.81	8.97	10.95	12.25	13.81	16.20
Aircraft Armament Program	0.11	0.12	0.13	0.16	0.77	1.89	3.63
Spare Engine Program	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Airfield Augmentation	0.00	0.18	0.27	0.55	0.78	0.96	1.14
Command and Control Program	0.78	0.85	0.87	0.88	0.88	0.88	0.88
Communication System	0.02	0.02	0.03	0.03	0.03	0.04	0.04
Radar Program	0.56	0.81	1.06	1.36	1.53	1.62	1.70
Heavy Gun Program	2.27	2.56	2.72	2.84	2.87	2.85	2.74
Fire Control (Heavy Gun)	0.12	0.17	0.23	0.30	0.34	0.38	0.38
Light Gun Program	2.46	2.52	2.69	2.82	2.91	2.88	3.02
Fire Control (Light Gun)	0.00	0.00	0.03	0.09	0.18	0.30	0.43
SA Guided Missile Program	0.00	0.15	0.65	1.26	1.95	2.98	3.95
Total	13.45	15.19	17.65	21.24	24.49	28.59	34.11

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Table 3

Estimated Sino-Soviet Bloc Air Defense Procurement
by Sectors of Origin, 1954 to 1960

Billion 1951 Rubles

	1954	1955	1956	1957	1958	1959	1960
Aircraft and Engine Procurement	8.87	9.31	15.42	18.57	23.24	25.75	31.32
Guided Missile Procurement	0.23	0.81	1.15	2.52	6.70	9.78	16.40
Armament Procurement	2.17	3.21	3.43	3.67	3.00	2.76	1.24
Ammunition Procurement	0.31	0.42	0.55	0.63	0.71	0.65	0.58
Special Electronic Procurement*	2.49	4.07	5.32	5.38	7.23	8.59	11.93
Fabricated Metals, NEC	1.47	1.80	2.09	1.79	2.96	3.28	5.06
Fuels	1.39	1.63	1.83	2.00	2.28	2.52	2.84
Total Industrial Procurement	16.93	21.25	29.79	34.66	46.12	53.60	69.37
Construction and Construction Material	4.77	6.79	7.02	6.26	5.88	5.90	5.75
Transportation	0.40	0.56	0.67	0.78	1.06	1.22	1.55
Personnel and Services	5.98	6.53	6.83	7.10	7.25	6.70	6.79
Training	2.18	2.44	2.72	2.26	2.22	2.10	2.12
Total	30.26	37.57	47.03	51.06	62.53	69.52	85.58

* Electronic procurement not included in other procurement categories (radar, fire control, and ground guidance equipment.)

is not revealed in the above over-all analysis is the very substantial impact upon the electronic and precision instrument industries. In all phases of the program the requirements from these industries are high. Using a procedure parallel to that used for deriving total costs, we have estimated the combined value of electronic equipment and precision mechanisms involved in the total air defense program outlined in this estimate. If it is assumed that roughly 80 percent of the combined electronics and precision mechanism requirement is for electronics, the estimated Soviet Bloc air defense program compares to the total electronic production as shown in Table 4.

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Table 4

Estimated Electronic Cost for Air Defense Program
1954 to 1960

		1954	1955	1956	1957	1958	1959	1960
Soviet Bloc Electronic Production	Billion 1951 Rubles	11.40	13.90	15.90	18.10	20.60	23.20	26.20
Available Electronic Capacity for Air Defense Products	Billion 1951 Rubles	5.20	6.70	7.30	8.60	10.00	11.50	13.20
Electronic Cost - Air Defense Program*	Billion 1951 Rubles	2.52	3.99	6.40	8.06	13.49	17.61	24.54
Electronic Cost - Air Defense Program as Percent of Total Soviet Bloc Electronic Production	Percent	22	29	40	45	65	76	94
Electronic Cost - Air Defense Program as Percent of Available Electronic Capacity for Air Defense Products	Percent	48	60	88	94	135	153	186

* Electronic cost is estimated as 80 percent of electronic and precision mechanism cost.

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